U.S. Serial No. 10/696,178 Reply to Office Action Dated: 23 Oct 2006

Docket No.: QA0237-US -DIV1

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A method of treating one or more conditions associated with p38 kinase activity wherein said conditions are selected from asthma, adult respiratory distress syndrome, chronic obstructive pulmonary disease, chronic pulmonary inflammatory disease, diabetes, inflammatory bowel disease, osteoporosis, psoriasis, graft vs. host rejection, atherosclerosis, and arthritis including rheumatoid arthritis, psoriatic arthritis, traumatic arthritis, rubella arthritis, gouty arthritis and osteoarthritis, comprising administering to a patient in need thereof at least one compound having the formula (I):

or a pharmaceutically acceptable salt, prodrug, or solvate thereof, wherein:

R₃ is hydrogen, methyl, perfluoromethyl, methoxy, halogen, cyano or NH₂;

$$X \text{ is selected from } -O-, -OC(=O)-, -S-, -S(=O)-, -SO_2-, -C(=O)-, -NR_{10}-, -NR_{10}C(=O)-, -NR_{10}C(=$$

$$-NR_{10}C(=O)NR_{11}-$$
, $-NR_{10}CO_2-$, $-NR_{10}SO_2-$, $-NR_{10}SO_2NR_{11}-$, $-SO_2NR_{10}-$,

-C(=O)NR₁₀-, halogen, nitro, and cyano, or X is absent;

Z is selected from O, S, N, and CR₂₀, wherein when Z is CR₂₀, said carbon atom may form an optionally-substituted bicyclic aryl or heteroaryl with R4 and R5;

$$-SO_2NR_{24}R_{25}, -CO_2R_{21}, -C(=\!O)NR_{24}R_{25}, -NH_2, -NR_{24}R_{25}, -NR_{21}SO_2NR_{24}R_{25}, \\$$

$$-NR_{21}SO_2R_{22}$$
, $-NR_{24}C(=O)R_{25}$, $-NR_{24}CO_2R_{25}$, $-NR_{21}C(=O)NR_{24}R_{25}$, halogen, nitro, or cyano;

R2 is selected from:

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> a) hydrogen, provided that R₂ is not hydrogen when X is -S(=O)-, -SO₂-, -NR₁₀CO₂-, or -NR₁₀SO₂-;

- b) alkyl, alkenyl, and alkynyl optionally substituted with up to four R26 or pentafluoroalkyl;
- c) aryl and heteroaryl optionally substituted with up to three R27; and
- d) heterocyclo and cycloalkyl optionally substituted with keto (=O), up to three R₂₇, and/or having a carbon-carbon bridge of 3 to 4 carbon atoms; or
- e) R2 is absent if X is halogen, nitro or cyano;
- (i) R₄ is substituted aryl, aryl substituted with NHSO₂alkyl, substituted heteroaryl, or an optionallysubstituted bicyclic 7-11 membered saturated or unsaturated carbocyclic or heterocyclic ring, and
- R_{3} is hydrogen, alkyl, or substituted alkyl, except when Z is O or S, R_{5} is absent, or alternatively,
- (ii) R₄ and R₅ taken together with Z form an optionally-substituted bicyclic 7-11 membered aryl or heteroaryl;
- $R_6 \ is \ hydrogen, \ alkyl, \ substituted \ alkyl, \ aryl, \ substituted \ aryl, \ heterocyclo, \ substituted \ heterocyclo, \\ -NR_7R_8, \ -OR_7, \ or \ halogen;$
- R_{10} and R_{11} are independently selected from hydrogen, alkyl, substituted alkyl, aryl, substituted aryl, cycloalkyl, substituted cycloalkyl, heterocyclo, and substituted heterocyclo;
- R₇, R₈, R₂₁, R₂₄, and R₂₅ are independently selected from hydrogen, alkyl, substituted alkyl, aryl, substituted aryl, heterocylco, and substituted heterocyclo;
- $R_{20} \ is \ hydrogen, \ lower \ alkyl, \ or \ substituted \ alkyl, \ or \ R_{20} \ may \ be \ absent \ if the \ carbon \ atom \ to \ which \ it \\ is \ attached \ together \ with \ R_4 \ and \ R_5 \ is \ part \ of \ an \ unsaturated \ bicyclic \ aryl \ or \ heteroaryl;$
- $R_{22}\,is\,alkyl,\,substituted\,alkyl,\,aryl,\,substituted\,aryl,\,heterocyclo,\,or\,substituted\,heterocyclo;\\$
- $R_{26}\,is\,selected\,from\,halogen,\,trifluoromethyl,\,haloalkoxy,\,keto\,(=\!O),\,nitro,\,cyano,\,-SR_{28},\,-OR_{28},$
 - $-NR_{28}R_{29},-NR_{28}SO_2,-NR_{28}SO_2R_{29},-SO_2R_{28},-SO_2NR_{28}R_{29},-CO_2R_{28},-C(=O)R_{28}\,,\\$

 - OH, =N-O-alkyl; aryl optionally substituted with one to three R_{27} , cycloalkyl optionally substituted with keto(=O), one to three R_{27} , or having a carbon-carbon bridge of 3 to 4 carbon atoms; and heterocyclo optionally substituted with keto (=O), one to three R_{27} , or having a carbon-carbon bridge of 3 to 4 carbon atoms; wherein R_{28} and R_{29} are each independently
 - selected from hydrogen, alkyl, alkenyl, aryl, aralkyl, C₃₋₇cycloalkyl, and C₃₋₇heterocycle, or

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optionally substituted with up to two of alkyl, alkenyl, halogen, halogakyl, halogakoxy, cyano. nitro, amino, hydroxy, alkoxy, alkylthio, phenyl, benzyl, phenyloxy, and benzyloxy; and R₂₇ is selected from alkyl, R₃₂, and C_{1.4}alkyl substituted with one to three R₃₂, wherein each R₃₂ group is independently selected from halogen, haloglkyl, haloglkoxy, nitro, cyano, -SR₂₀, -OR₂₀, $-NR_{30}R_{31}$, $-NR_{30}SO_2$, $-NR_{30}SO_2R_{31}$, $-SO_2R_{30}$, $-SO_2NR_{30}R_{31}$, $-CO_2R_{30}$, $-C(=O)R_{30}$. $-C(=O)NR_{30}R_{31}$, $-OC(=O)R_{30}$, $-OC(=O)NR_{30}R_{31}$, $-NR_{30}C(=O)R_{31}$, $-NR_{30}CO_{2}R_{31}$, and a 3 to 7 membered carbocyclic or heterocyclic ring optionally substituted with alkyl, halogen, hydroxy, alkoxy, haloalkyl, haloalkoxy, nitro, amino, or cyano, wherein R₃₀ and R₃₁ are each independently selected from hydrogen, alkyl, alkenyl, aryl, aralkyl, C3.7cycloalkyl, and heterocycle, or may be taken together to form a C3.7heterocycle.

may be taken together to form a C_{3.7}heterocycle; and wherein each R₂₈ and R₂₀ in turn is

2. (Currently Amended) The method of claim 1 comprising administering to the patient at least one compound having the formula (I), or a pharmaceutically acceptable salt, prodrug or solvate thereof, wherein:

X is selected from
$$-C(=0)$$
, $-NR_{10}$, $-NR_{10}C(=0)$, $-NR_{10}CO_2$, $-NR_{10}SO_2$, $-SO_2NR_{10}$, and $-C(=0)NR_{10}$, or X is absent;

Z is N:

R2 is hydrogen, C2.6alkyl, C1.4alkyl substituted with up to four R26, pentafluoroalkyl, or aryl or heteroaryl optionally substituted with up to two R27;

R4 is phenyl substituted with one R12 and zero to three R13;

R₅ and R₁₀ independently are selected from hydrogen and lower alkyl;

R₁₂ is carbamyl, sulfonamido, arylsulfonylamine, or ureido, each of which is optionally substituted with up to two of hydroxy, alkyl, substituted alkyl, alkoxy, aryl, substituted aryl, and aralkyl, or alkylsulfonylamine;

R₁₃ at each occurrence is independently selected from alkyl, substituted alkyl, halo,

trifluoromethoxy, trifluoromethyl,
$$-OR_{14}$$
, $-C(=O)$ alkyl, $-OC(=O)$ alkyl, $-NR_{15}R_{16}$, $-SR_{15}$, $-NO_2$, $-CN$, $-CO_2R_{15}$, $-CONH_2$, $-SO_3H$, $-S(=O)$ alkyl, $-S(=O)$ aryl, $-NHSO_2$ -aryl- R_{17} , $-NHSO_2$ -alkyl, $-SO_3NHR_{17}$, and $-NHC(=O)NHR_{17}$;

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R₁₄ is hydrogen, alkyl, or aryl;

R₁₅ is hydrogen or alkyl;

R₁₆ is hydrogen, alkyl, aralkyl, or alkanoyl; and

R₁₇ is hydrogen, hydroxy, alkyl, substituted alkyl, alkoxy, aryl, substituted aryl, or aralkyl.

3. (Currently Amended) A method of treating one or more conditions associated with p38 kinase activity wherein said conditions are selected from asthma, adult respiratory distress syndrome, chronic obstructive pulmonary disease, chronic pulmonary inflammatory disease, diabetes, inflammatory bowel disease, osteoporosis, psoriasis, graft vs. host rejection, atherosclerosis, and arthritis including rheumatoid arthritis, psoriatic arthritis, traumatic arthritis, rubella arthritis, gouty arthritis and osteoarthritis, comprising administering to a patient in need thereof at least one compound having the formula (I):

or a pharmaceutically acceptable salt, prodrug or solvate thereof, wherein:

R₃ is hydrogen, methyl, perfluoromethyl, methoxy, halogen, cyano or NH₂;

X is selected from -O-, -OC(=O)-, -S-, -S(=O)-, -SO₂-, -C(=O)-, -NR₁₀-, -NR₁₀C(=O)-,

$$-NR_{10}C(=O)NR_{11}-, -NR_{10}CO_2-, -NR_{10}SO_2-, -NR_{10}SO_2NR_{11}-, -SO_2NR_{10}-, \\$$

-C(=O)NR₁₀-, halogen, nitro, and cyano, or X is absent;

Z is O, S, N, or CR20;

R₁ is hydrogen, -CH₃, -OH, -OCH₃, -SH, -SCH₃, -OC(=O)R₂₁, -S(=O)R₂₂, -SO₂R₂₂,
-SO₂NR₂₄R₂₅, -CO₂R₂₁, -C(=O)NR₂₄R₂₅, -NH₂, -NR₂₁SO₂NR₂₄R₂₅, -NR₂₁SO₂R₂₂,
-NR₂₄C(=O)R₂₅, -NR₂₄CO₂R₂₅, -NR₂₁C(=O)NR₂₄R₃₅, halogen, nitro, or evano:

R₂ is hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, alkynyl, substituted alkynyl, aryl, substituted aryl, heterocyclo, substituted heterocyclo, aralkyl, substituted aralkyl, or heterocycloalkyl, or substituted heterocycloalkyl, or when X is halo, nitro or cyano, R₂ is

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absent, provided that R_2 is not hydrogen when X is -S(=O)-, $-SO_2-$, $-NR_{10}CO_2-$, or $-NR_{10}SO_2-$;

R₄ is substituted aryl, aryl substituted with NHSO₂alkyl, substituted heteroaryl, or an optionallysubstituted bicyclic 7-11 membered saturated or unsaturated carbocyclic or heterocyclic ring system;

R₅ is hydrogen, alkyl, or substituted alkyl, except that when Z is O or S, R₅ is absent;

R₆ is hydrogen, alkyl, substituted alkyl, aryl, substituted aryl, heterocyclo, substituted heterocyclo, -NR₇R₈, -OR₇, or halogen;

R₇, R₈, R₁₀, R₁₁, R₂₁, R₂₄, and R₂₅ are independently selected from hydrogen, alkyl, substituted alkyl, aryl, substituted aryl, heterocyclo, and substituted heterocyclo;

R₂₀ is hydrogen, lower alkyl, or substituted alkyl; and

R₂₂ is alkyl, substituted alkyl, aryl, substituted aryl, heterocyclo, or substituted heterocyclo.

4. (Currently Amended) The method of claim 3 comprising administering to the patient at least one compound of formula (I), in which R₄, R₅ and Z are represented by:

or a pharmaceutically acceptable salt, prodrug or solvate thereof, wherein:

 $R_{12}\,\mathrm{is}$ attached to any available carbon atom of phenyl ring A and is selected from carbamyl,

 $\label{eq:sulfonamide} sulfonylamine, and ure ido, each of which is optionally substituted with up to one of hydroxy, alkyl, substituted alkyl, alkoxy, aryl, substituted aryl, and aralkyl, or C_1-$4lkylsulfonylamine;}$

 $R_{13} \ is \ attached \ to \ any \ available \ carbon \ atom \ of \ phenyl \ ring \ A \ and \ at \ each \ occurrence \ is$ $independently \ selected \ from \ alkyl, \ substituted \ alkyl, \ halo, \ trifluoromethoxy, \ trifluoromethyl,$ $-OR_{14}, -C(=O) alkyl, -OC(=O) alkyl, -NR_{15}R_{16}, -SR_{15}, -NO_2, -CN, -CO_2R_{15}, -CONH_2,$ $-SO_3H, -S(=O) alkyl, -S(=O) aryl, -NHSO_2-aryl-R_{17}, -NHSO_2C_{14} alkyl, -SO_3NHR_{175}$

-CONHR₁₇, and -NHC(=O)NHR₁₇;

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R₁₄ is hydrogen, alkyl, or aryl;

R₁₅ is hydrogen or alkyl;

R₁₆ is hydrogen, alkyl, aralkyl, or alkanoyl; and

 R_{17} is hydrogen, hydroxy, alkyl, substituted alkyl, alkoxy, aryl, substituted aryl, or aralkyl; and n is 0, 1, 2 or 3.

(Currently Amended) The method of claim 3 comprising administering to the patient at least one compound having the formula (II):

or a pharmaceutically acceptable salt, prodrug, or solvate thereof, wherein:

R₃ is methyl or CF₃;

X is
$$-C(=O)NR_{10}-$$
, $-NR_{10}C(=O)-$, or $-C(=O)-$;

R₁ is hydrogen, -CH₃, -OH, -OCH₃, halogen, nitro, or cyano;

R₁₀ is hydrogen or lower alkyl;

 $R_{18} \ is \ selected \ from \ hydrogen, \ alkyl, \ alkoxy, \ aryl, \ and \ aryl \ substituted \ with \ one to \ three \ R_{19}, \ except$ that when Y is $-NHSO_2-$, R_{18} is C_{1-4} alkyl, aryl or aryl substituted with R_{19} ;

 $R_{13}\, is$ attached to any available carbon atom of phenyl ring A and at each occurrence is

independently selected from alkyl, substituted alkyl, halo, trifluoromethoxy, trifluoromethyl,

$$-OR_{14}, -C(=O) alkyl, -OC(=O) alkyl, -NR_{15}R_{16}, -SR_{15}, -NO_2, -CN, -CO_2R_{15}, -CONH_2, \\$$

$$-SO_3H, -S(=O)alkyl, -S(=O)aryl, -NHSO_2-aryl-R_{17}, -NHSO_2C_{1-4}alkyl, -\textcolor{red}{SO_2NHR_{17}}, -\textcolor{red}{SO_3NHR_{17}}, -\textcolor{red}{SO_3NH$$

-CONHR₁₇, and -NHC(=O)NHR₁₇;

 R_{14} , R_{15} , R_{16} and R_{17} are hydrogen or alkyl;

R₁₉ at each occurrence is selected from alkyl, halo, trifluoromethoxy, trifluoromethyl, hydroxy, alkoxy, alkanoyl, alkanoyloxy, thiol, alkylthio, ureido, nitro, cyano, carboxy, carboxyalkyl,

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carbamyl, alkoxycarbonyl, alkylthiono, arylthiono, arylsulfonylamine, sulfonic acid, alkysulfonyl, sulfonamido, and aryloxy, wherein each group R_{19} may be further substituted by hydroxy, alkyl, alkoxy, aryl, or aralkyl; and

n is 0, 1 or 2.

6. (Currently Amended) The method of claim 3, comprising administering to the patient at least one compound having the formula (la), or (lb), or (le):

or a pharmaceutically acceptable salt, prodrug or solvate thereof, wherein:

R₃ is methyl or CF₃;

 $R_{2a} \ and \ R_{2c} \ are \ independently selected from \ hydrogen, C_{2-6} alkyl, \ substituted \ C_{1-4} alkyl, \ aryl, \\ substituted \ aryl, \ benzyl, \ and \ substituted \ benzyl;$

R_{2b} is heterocyclo or substituted heterocycle; and

R₁₀ is hydrogen or lower alkyl.

7-8. (Canceled)

9-11. (Previously Canceled)